LISTING OF CLAIMS:

What is claimed is:

1. **(Currently amended)** A node of an optically amplified wavelength division multiplexing network, the node connecting at least one upstream optical fiber link to at least one downstream optical fiber link, comprising:

a receiver amplifier, the receiver amplifier receiving an optical signal comprising a plurality of optical channels from the at least one upstream optical fiber link, the receiver amplifier further comprising at least one pump laser;

an optical add/drop multiplexing module, the optical add/drop multiplexing module adapted to at least one of drop at least one of the plurality of optical channels, pass at least one of the plurality of optical channels, and add at least one of the plurality of optical channels;

a transmitter amplifier, the transmitter amplifier amplifying the at least one of the plurality of optical channels passed and the at least one of the plurality of optical channels added; and

an optical tap upstream of the receiver amplifier, the optical tap monitoring an optical signal power, the receiver amplifier amplifying the optical signal during normal operation and operating as a noise source generating an output noise power in response to a loss of signal from the at least one upstream optical fiber link being detected by the optical tap<u>, wherein the receiver amplifier comprises circuitry to shut down the receiver amplifier after detecting the loss of signal, wherein the at least one upstream optical fiber link provides an input signal to at least one downstream amplifier with gain control circuitry, the circuitry of the receiver amplifier being adapted to shut down the receiver amplifier at a speed less than a speed of response of the gain control circuitry of the at least one downstream amplifier</u>.

2. (Canceled)

3. (Canceled)

4. (**Currently amended**) The node of Claim <u>1</u> ~~3~~, wherein the gain control circuitry comprises an automatic gain control.

5. (Original) The node of Claim 1, wherein the at least one pump laser is adapted to increase the output noise power of the receiver amplifier to a predetermined target level of output noise in response to the loss of signal being detected.

6. (Original) The node of Claim 5, further comprising local data storage, the local data storage storing the predetermined target level of output noise power, a predetermined target level of pump power, and a corresponding calculated operating parameter needed to operate the at least one pump laser at the predetermined target level of pump power.

7. (Original) The node of Claim 6, wherein the receiver amplifier comprises a feed forward control circuit, the feed forward control circuit adjusting the at least one pump laser to increase the output noise power to the predetermined target level of output noise in response to the loss of signal being detected, the feed forward control circuit extracting the predetermined target level of pump power and the corresponding calculated operating parameter from the local data storage.

8. (Original) The node of Claim 5, wherein the predetermined target level of output noise is calculated by adjusting an input noise power by at least one of a spectral filtering factor of the optical add/drop multiplexing module and a noise power conversion efficiency of the receiver amplifier, wherein the input noise power is substantially equal to a received signal power at the transmitter amplifier from the at least one of the plurality of optical channels passed before loss of signal.

9. (Original) The node of Claim 7, the feed forward control circuit comprising a response time of less than about ten microseconds.

10. (Original) The node of Claim 1, wherein the at least one upstream optical fiber link comprises at least two upstream optical fiber links and the at least one downstream optical fiber link comprises at least two optical fiber links.

11. (Original) The node of Claim 1, wherein the node comprises an optical cross-connection node.

12. (Original) The node of Claim 1, wherein the at least one downstream optical fiber link comprises at least one in-line optical amplifier.

13. (Original) The node of Claim 1, wherein the optical add/drop multiplexing module comprises signal conditioning features.

14. (Original) A method for controlling transients in a downstream optical fiber link caused by a loss of signal in an upstream optical fiber link of an optically amplified wavelength division multiplexing network, the method comprising the steps of:

provisioning an optical add/drop multiplexing node, the optical add/drop multiplexing node comprising a receiver amplifier, an optical add/drop multiplexing module, and a transmitter amplifier, the receiver amplifier comprising at least one pump laser operating at a pump power, provisioning comprising at least one of dropping at least one channel from an optical signal, passing through at least one channel, and adding at least one channel to the optical signal;

calculating a received signal power at an input of the transmitter amplifier from the at least one channel passed before a loss of signal;

detecting the loss of signal upstream of the receiver amplifier; and

operating the receiver amplifier as a noise source generating an output noise power in response to the loss of signal, the receiver amplifier generating an input noise power at the transmitter amplifier, wherein the input noise power is substantially equal to the received signal power.

15. (Canceled)

16. (**Currently amended**) ~~The method according to Claim 14, further~~ A method for controlling transients in a downstream optical fiber link caused by a loss of signal in an upstream optical fiber link of an optically amplified wavelength division multiplexing network, the method comprising the steps of:

provisioning an optical add/drop multiplexing node, the optical add/drop multiplexing node comprising a receiver amplifier, an optical add/drop multiplexing module, and a transmitter amplifier, the receiver amplifier comprising at least one pump laser operating at a pump power, provisioning comprising at least one of dropping at least one channel from an optical signal, passing through at least one channel, and adding at least one channel to the optical signal;

calculating a received signal power at an input of the transmitter amplifier from the at least one channel passed before a loss of signal;

detecting the loss of signal upstream of the receiver amplifier;

operating the receiver amplifier as a noise source generating an output noise power in response to the loss of signal, the receiver amplifier generating an input noise power at the transmitter amplifier;

calculating a target level of output noise power from the receiver amplifier, the target level of output noise power resulting in the input noise power at the transmitter amplifier after loss of signal being substantially equal to the received signal power before loss of signal;

calculating a target level of pump power needed to pump the receiver amplifier to generate the output noise power substantially equal to the target level of output noise power; and

calculating a corresponding operating parameter needed to operate the at least one pump laser at the target level of pump power, wherein the steps of calculating the target level of output noise power, the target level of pump power, and the corresponding operating parameter are performed before the step of detecting the loss of signal; and

increasing a pump power of the at least one pump laser to the target level of pump power in response to detecting the loss of signal.

17. (Original) The method according to Claim 16, wherein the step of calculating the target level of output noise power comprises adjusting the input noise power by a spectral filtering factor of the optical add/drop multiplexing module, and by a lower power conversion efficiency after loss of signal of the receiver amplifier.

18. (Original) The method according to Claim 16, further comprising storing the target level of pump power, the target level of output noise power and the corresponding operating parameter for the receiver amplifier locally before detecting the loss of signal.

19. (Original) The method according to Claim 18, wherein the step of increasing the pump power of the at least one pump laser to the target level of pump power comprises using feed forward control circuitry to extract the stored target level of pump power and the corresponding operating parameter to increase the output noise power to substantially equal the target level of output noise power in response to detecting the loss of signal.

20. (Original) The method according to Claim 16, further comprising the step of shutting down the receiver amplifier by reducing the pump power after the step of detecting the loss of signal.

21. (Original) The method according to Claim 20, wherein the step of shutting down the receiver amplifier is performed at a speed substantially slower than a speed of response of one of an automatic gain control and stimulated Raman scattering induced tilting control speed of one of a downstream optical amplifier and the transmitter amplifier.

22. (Original) The method according to Claim 14, further comprising the step of regulating the receiver amplifier as a constant high power noise source using an automatic power control circuit in response to detecting the loss of signal.

23. (Original) The method according to Claim 14, wherein the step of detecting the loss of signal comprises tapping and monitoring the optical signal from the upstream optical fiber link.

24. (Original) The method according to Claim 14, further comprising the step of adjusting the optical add/drop multiplexing module to pass a substantial amount of the output noise power from the receiver amplifier after loss of signal without impacting the at least one channel passed and the at least one channel added during normal operation before loss of signal.

25. (Original) A method for controlling transients in a downstream optical fiber link caused by a loss of signal in an upstream optical fiber link of an optically amplified wavelength division multiplexing network, the method comprising the steps of:

provisioning an optical add/drop multiplexing node, the optical add/drop multiplexing node comprising a receiver amplifier, an optical add/drop multiplexing module, and a transmitter amplifier, the receiver amplifier further comprising at least one pump laser operating at a pump power, provisioning comprises at least one of dropping a channel from an optical signal, passing through at least one channel, and adding at least one channel to the optical signal;

adjusting the optical add/drop multiplexing module to pass a substantial amount of an output noise power from the receiver amplifier after loss of signal without impacting transmission of at least one of the passed channel and the added channel during normal operation before the loss of signal;

calculating a received signal power at an input of the transmitter amplifier from the at least one passed channel before the loss of signal;

calculating a target level of output noise power from the receiver amplifier, an output noise power substantially equal to the target level of output noise power resulting in an input noise power at the input of the transmitter amplifier after loss of signal substantially equal to the received signal power before the loss of signal;

calculating a target level of pump power needed to pump the receiver amplifier to generate an output noise power substantially equal to the target level of output noise power;

calculating a corresponding operating parameter needed to operate the at least one pump laser at the target level of pump power;

detecting the loss of signal upstream of the receiver amplifier;

operating the receiver amplifier as a noise source and generating output noise power in response to detecting the loss of signal; and

increasing the pump power of the at least one pump laser to the target level of pump power in response to detecting the loss of signal.

26. (Original) The method according to Claim 25, wherein the step of calculating the target level of output noise power comprises adjusting the input noise power by at least one of a spectral filtering factor of the optical add/drop multiplexing module and a noise power conversion efficiency of the receiver amplifier.

27. (Original) The method according to Claim 25, further comprising storing the target level of pump power, the target level of output noise power, and the corresponding operating parameter for the receiver amplifier locally, before the step of detecting the loss of signal.

28. (Original) The method according to Claim 27, wherein the step of increasing the pump power of the at least one pump laser to the target level of pump power comprises using feed forward control circuitry to extract the stored target level of pump power and the target level of output noise, and to increase the output noise power to substantially equal the target level of output noise power in response to detecting the loss of signal.

29. (Original) The method according to Claim 25, further comprising the step of shutting down the receiver amplifier by reducing the pump power after the step of detecting the loss of signal.

30. (Original) The method according to Claim 29, wherein the step of shutting down the receiver amplifier is performed at a speed substantially slower than a speed of response of one of an automatic gain control and stimulated Raman scattering induced tilting control speed of one of a downstream optical amplifier and the transmitter amplifier.

31. (Original) The method according to Claim 25, further comprising the step of regulating the receiver amplifier as a constant high power noise source using an automatic power control circuit after the step of detecting the loss of signal.